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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,983	03/23/2001	Mark Lynn Jenson	1327.005US1	7609

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EXAMINER	
WINTER, GENTLE E	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/815,983	JENSON ET AL.	
	Examiner	Art Unit	
	Gentle E. Winter	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 37-84* is/are pending in the application.

4a) Of the above claim(s) *37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 38-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification and Drawings

Applicant's corrections and clarifications have overcome the objections to the drawings and the specification.

Claim Objections

Claim 73 is objected to because of the following informalities: Claim 13 and 73 are substantively identical. Appropriate correction is required.

Provisional Double Patenting

As applicant has noted the Obviousness Double Patenting rejection is properly held in abeyance pending the allowance of one or more of the applications. It is altogether acceptable to delay filing a terminal disclaimer until identifiable subject matter has been identified. Thus, the while the proper rejections remain no further action is required from applicant until the claims are in position for allowance.

Claim Rejections - 35 USC § 102—Response to Remarks

Applicant's remarks have been carefully considered but are not persuasive. Applicant states: "the present invention is to a method for making a thin-film battery…". The argument that the *invention* is drawn to making a thin film battery is credible, the *claim* however is drawn to making an energy storage device. Since the method steps in the reference are identical to those

in the claim, the claim is properly anticipated. The Remarks going to the meaning ascribed to a capacitor are made in a battery context.

Claim Rejections - 35 USC § 103—Response to Remarks

With respect to the remarks related to the 35 USC § 103 rejection, Applicant argues that Veerasamy does not suggest that depositing materials such as LiPON. Veerasamy was provided for the teaching that various ion energies could be used. Bhattacharyya speaks to the materials. As to the energy values, specifically claim 7, since the claim uses open claim language, a period of 0 eV is disclosed, both in the claim and the references.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 8-11, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,333,808 to Bhattacharyya ('808).

2. The '808 reference reads on the claim 1 as follows, both disclose a method comprising providing a substrate and forming an electrode first film (deposit metal on the substrate); forming an electrolyte second film (metal oxide), wherein forming the electrolyte second film includes depositing electrolyte material (metal oxide) using a deposition source (R-F sputtering); and supplying energized particles (ion beam implantation) from a second source (O+ on N+) such

that the particles provide energy to the electrolyte material to deposit the electrolyte material into a desired film structure (convert crystalline to amorphous); and forming an electrode third film on the second film (counter electrode on electrolyte).

3. As to claims 2 and 3, disclosing the method of claim 1, wherein supplying energized particles includes supplying ions having an energy of greater than about 5 eV and 3000 eV. At column 3, line 7 *et seq*

4. As to claim 8-11 and 22, disclosing that the electrolyte film has a thickness of less than 5000 A, 2500 A, 1000 A, 500 A, 1nm to 1000nm, respectively, the same is disclosed at column 3, line 8 *et seq*.

5. As to claims 19-21 disclosing the method of claim 1, wherein forming the electrolyte film includes forming the electrolyte film to a thickness sufficient to insulate the electrode first film from the electrode second film and to allow ion transport between the electrode first film and the electrode second film. Inherently the transition metal possess the indicated characteristics, see column 3, line 50 *et seq*. discussing dielectric constants. The oxide is the intercalation layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 4-7, 42-48, and 53-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 4,333,808 and PGPub 2001/0014398. ('398). The '808 reference identically discloses the claimed invention except it fails to explicitly disclose that the energized particles have an energy in the range of 5eV to 500eV, 5eV to 250eV, 10eV to 200eV, 0eV to 40eV, 10eV to 500eV, 10eV to 400eV, 10eV to 300eV, 10eV to 250eV, 10eV to 200eV, 10eV to 150eV, 10eV to 100eV, 20 to 300, 20 to 250, 20 to 200, 20 to 150, and 20 to 100. The '398 reference provides the missing element and explicitly provides the motivation for making the instant combination. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine '808 and '398 as taught by '398, since the '398 reference states at paragraphs 69 and 70 provide the missing elements and explicitly provide the motivation for making the instant combination. The artisan would have been motivated to make the instant combination disclosing that laminate induced substrate stresses can be controlled and decreased by increasing the ion energy the deposition process to a range of from about 200-1,000 eV. The reference goes on to state that in one embodiment the energy is: "preferably from about 100-150 eV, and most preferably from about 100-140 eV) per carbon ion. At these energies, films 7 (i.e. layer 3 in the FIG. 2 embodiment) emulate diamond." In a larger sense, the values recited amount to little more than a results dependant variable, well within the grasp of one of ordinary skill in the relevant art.

2. Claims 12-15, and 62-73, are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 4,333,808 and United States Patent No. 6,576,369 ('369).

3. As to claims 12-15, and 62-73 disclosing that the electrolyte second film has a thickness of various values.

4. The art is with replete with teaching of various thickness layers. The '808 reference identically discloses the claimed invention except it fails to explicitly disclose that the electrolyte film has a thickness of 10-100 Angstroms. The '369 reference provides the missing element and explicitly provides the motivation for making the instant combination. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine '808 and '369 as taught by '369. The '369 patent teaches the disclosed range and the reason behind altering the range. Specifically, the '369 patent teaches that if the crystallite size is less than 100 Angstroms, the crystallite is so small as to introduce a significant disturbance into the crystal lattices, and it does not allow lithium ions entering through the open interstices to be efficiently received therein. On the other hand, in order to achieve a crystallite size exceeding 2000 Angstroms a damaging prolonged heat treatment is required. The crystallite size is more preferably in the range of 500 to 1500 Angstroms. See e.g. column 8, line 14 et seq. Elsewhere the crystallite has a reported diameter of 100 to 2000 Angstroms (20010051300).

5. Claims 7, 38-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 4,333,808 as set forth above and 6,086,962 to Mahoney 49-52, 58-61 and 74-79.

6. Each and every limitation of claims 7, 49-52, and 58-61 is identically disclosed in '808, as set forth above, except '808 fails to explicitly disclose the lower eV values. The '962 reference discloses the lower values, and provides the explicit motivation for making the claimed combination. Namely, Mahoney discloses that layers can be deposited at "surprisingly low time-averaged ion energies, i.e. less than 40 eV, using various hydrocarbon feed gases." At column 7, line 10 *et seq*, the '962 reference discloses that such a modification provides a desired film structure (hard DLC coating).

7. Claims 16-18, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 4,333,808 and PGPub 2002/0076616 to Lee ('616).

8. Claims 16-18 and 23 relate to depositing an Li3PO4 electrolyte material, supplying energized nitrogen particles, and reacting the nitrogen particles with the Li3PO4 electrolyte material, and providing a nitrogen-enriched atmosphere in which the Li3PO4 electrolyte material is deposited.

9. The '808 reference identically discloses the claimed invention except it fails to explicitly disclose the steps relating to Li3PO4 . The '616 reference provides the missing element and explicitly provides the motivation for making the instant combination. Specifically at paragraph 65, the '616 reference teaches that the solid electrolyte, LixPOyNz, layer was deposited by RF magnetron sputtering of a Li3PO4 target in a nitrogen atmosphere. The energized nitrogen is taught in the '808 reference. It would have been obvious to one having ordinary skill in the art at

the time the invention was made to combine '808 and '616 as taught by '616, since '616 states at paragraph [0063] that such a modification long term capacity stability. See also paragraph [0050] on especially on page 6.

10. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over 4,333,808 and United States Patent No. 5,202,196 Wang et al. ('196).

11. Claims 24 and 25 disclose that the electrolyte film is an oxide of aluminum or silicon. The same is disclosed in '196, as is the motivation for making the claimed combination. The '808 identically discloses the claimed invention except '808 fails to explicitly disclose that the oxide of silicon is an electrolyte (see example 1 of '808). The '196 reference provides the missing element and explicitly provides the motivation for making the instant combination. Specifically, '196 discloses "to further increase the capacity, it is preferred to add aluminum hydroxide to the colloidal electrolyte. The content of aluminum hydroxide in the colloidal electrolyte (based on the weight of the colloidal electrolyte as 100%) is preferably 0.1-0.5 wt. % (based on aluminum oxide). The silica sol as one of starting materials for producing the colloidal electrolyte is a commercial product, which contains 10-30% of silicon dioxide..."

12. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine '808 and '196 as taught by '196, since it indicates that the combination results in improved capacity.

13. Claims 80-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 4,333,808 and PGPub 2002/0076616 to Lee ('616), further in view of United States Patent No. 5,705,293 to Hobson. The '808 and '616 references disclose the claimed invention, as set forth above, except the aggregated references fail to disclose the step of forming a first film by depositing a vanadium oxide. Hobson teaches the missing element and explicitly provides the motivation for making the claimed combination. Hobson teaches that it was known to create a solid-state, thin-film Li battery by constructing in the anode/electrolyte/cathode geometry. Hobson goes on to disclose that the anode is a lithium alloy, that the electrolyte is a Li phosphorus oxynitride (LiPON); and that the cathode is any one of a number of Li intercalation compounds, such as V2O5 as set forth at column 4, line 10 *et seq*. It would have been obvious to one having ordinary skill in the art at the time the invention was made to improve high temperature performance by using the indicated system, as taught by Hobson in order to provide a energy storage system that has high temperature stability as indicated at column 2, line 64 *et seq*.

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (571) 272-1310. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gentle E. Winter
Examiner
Art Unit 1746

June 11, 2004

RANDY GULAKOWSKI
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